US010745216B2

(12) **United States Patent**
Wagner

(10) **Patent No.: US 10,745,216 B2**
(45) **Date of Patent: Aug. 18, 2020**

(54) **STICKERS FOR DRYING AND/OR CURING MATERIALS**

(71) Applicant: **Pacific Western Timbers, Inc.**, Bremerton, WA (US)

(72) Inventor: **John W. Wagner**, Seabeck, WA (US)

(73) Assignee: **Pacific Western Timbers, Inc.**, Bremerton, WA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 447 days.

(21) Appl. No.: **14/676,156**

(22) Filed: **Apr. 1, 2015**

(65) **Prior Publication Data**

US 2016/0290717 A1 Oct. 6, 2016

(51) **Int. Cl.**

B65G 57/00	(2006.01)
F26B 25/18	(2006.01)
B65G 1/14	(2006.01)

(52) **U.S. Cl.**

CPC ***B65G 57/005*** (2013.01); ***B65G 1/14*** (2013.01); ***F26B 25/185*** (2013.01); *F26B 2210/16* (2013.01)

(58) **Field of Classification Search**

CPC F26B 25/00; F26B 2210/16; B65G 57/005; B65G 60/00; B65G 57/02; B65G 57/16

USPC 34/239, 297, 282, 442, 188, 216, 217, 34/518; 144/371; 108/57.18

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,343,410	A *	3/1944	Gottschalk	F26B 9/06 144/28
3,907,130	A *	9/1975	Hutcheson	B65G 1/0442 34/94
4,194,298	A *	3/1980	Hart	F26B 5/16 34/331
5,345,695	A *	9/1994	Graham	F26B 25/185 34/239

(Continued)

FOREIGN PATENT DOCUMENTS

AT	407242	B *	1/2001	F26B 25/185
DE	29902104	U1 *	6/1999	B65G 57/005
EP	0563887	A2 *	10/1993	H02B 1/306

OTHER PUBLICATIONS

80/20 Inc.; "80/20 Inc., 1010, 10 Series, 1" x 1" T-Slotted Extrusion x 97""; Apr. 11, 2012; Amazon.com; http://www.amazon.com/80-20-Series-T-Slotted-Extrusion/dp/B001F0F112.*

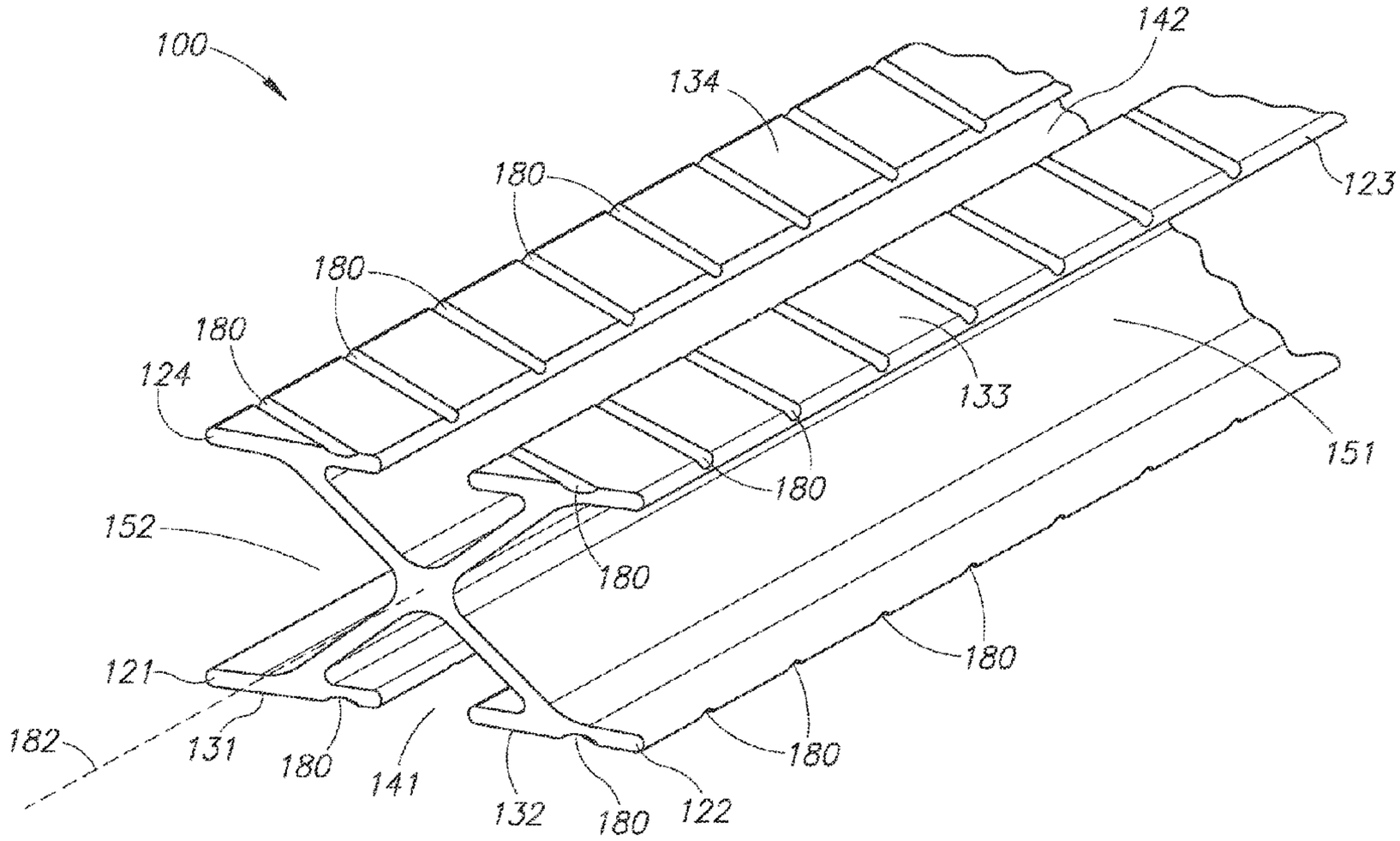
(Continued)

Primary Examiner — Jorge A Pereiro
Assistant Examiner — Logan P Jones
(74) *Attorney, Agent, or Firm* — Davis Wright Tremaine LLP; Heather M. Colburn

(57) **ABSTRACT**

A separator and/or stack stabilizer (referred to as a sticker) used to stack materials for drying and/or curing. The sticker has support members that extend radially outwardly from a central portion. An open-ended channel configured to allow air to flow therethrough is defined between each adjacent pair of support members. Together, the central portion and at least a portion of the support members may have an

(Continued)



X-shaped cross-sectional shape. A different support platform having a support surface may be connected to each of the support members. Optionally, the support surfaces include airflow grooves. The sticker may be constructed entirely of a material that includes aluminum.

38 Claims, 6 Drawing Sheets

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,704,134	A *	1/1998	Carter	F26B 25/185 211/59.4
5,813,137	A *	9/1998	Townsend	B27C 5/00 248/346.01
5,950,720	A *	9/1999	Klix	F24D 3/165 165/179
6,134,803	A *	10/2000	Gilchrist	F26B 25/185 34/239
6,243,970	B1 *	6/2001	Culp	F26B 21/02 34/218
6,345,652	B1 *	2/2002	Townsend	B27C 5/00 144/116
RE38,118	E *	5/2003	Townsend	B27C 5/00 248/346.01
7,003,898	B2 *	2/2006	Aaron	F26B 25/185 34/239
7,926,199	B2 *	4/2011	Aaron	F26B 25/185 248/346.02
8,209,917	B1 *	7/2012	DeZaio	E04C 2/384 52/285.3
2005/0028399	A1 *	2/2005	Merschat	F26B 5/045 34/92

OTHER PUBLICATIONS

Dough_baker; "Using aluminium sticker for air drying"; Feb. 18, 2015; The Forestry Forum; http://forestryforum.com/board/index.php?topic=814237.0.*

* cited by examiner

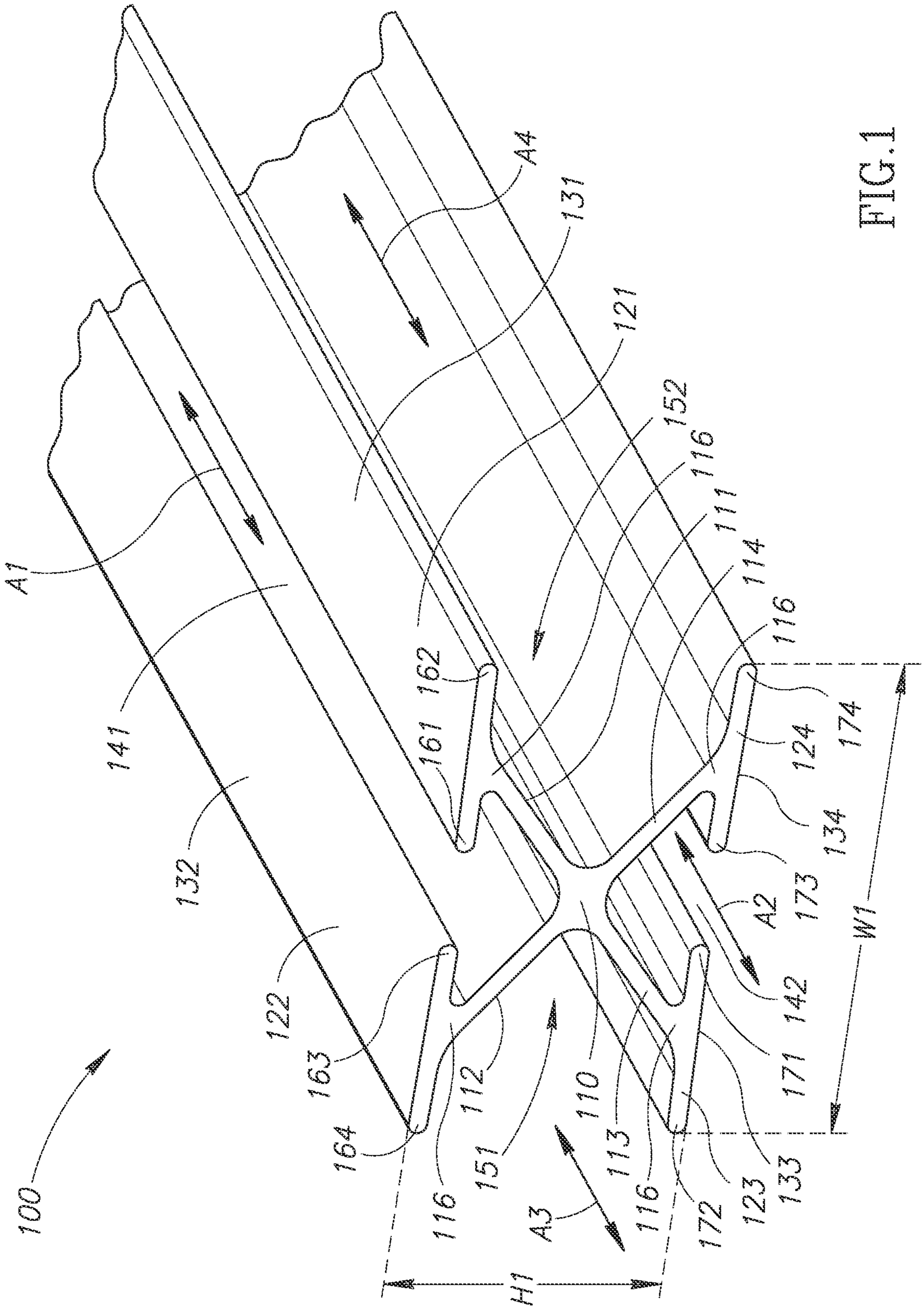

A4
131
121
152
116
111
114
116
162
161
124
174
134
173
A2
W1
A1
141
132
122
163
164
112
151
110
113
116
116
A3
172
123
133
142
171
H1
100

FIG. 1

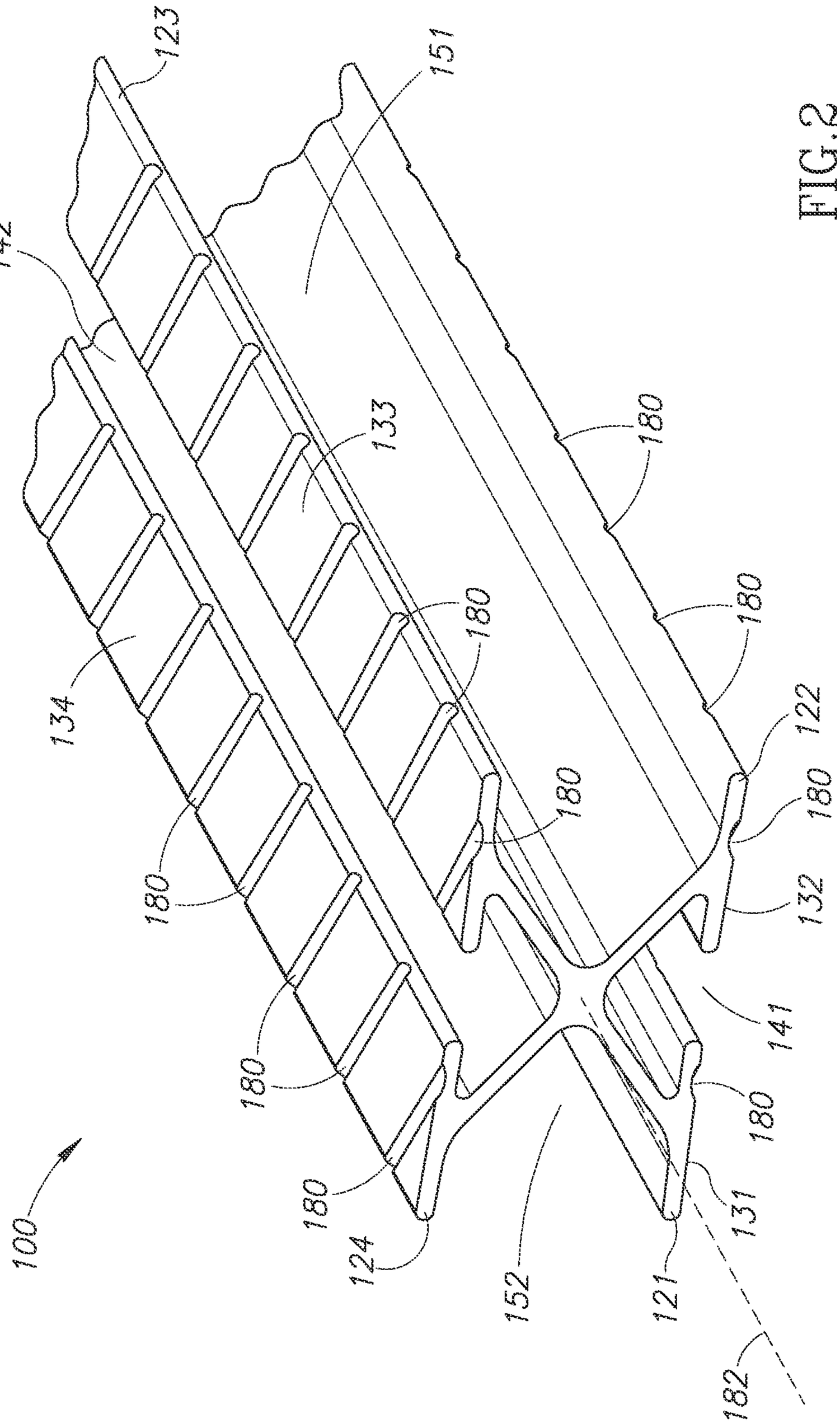


FIG. 2

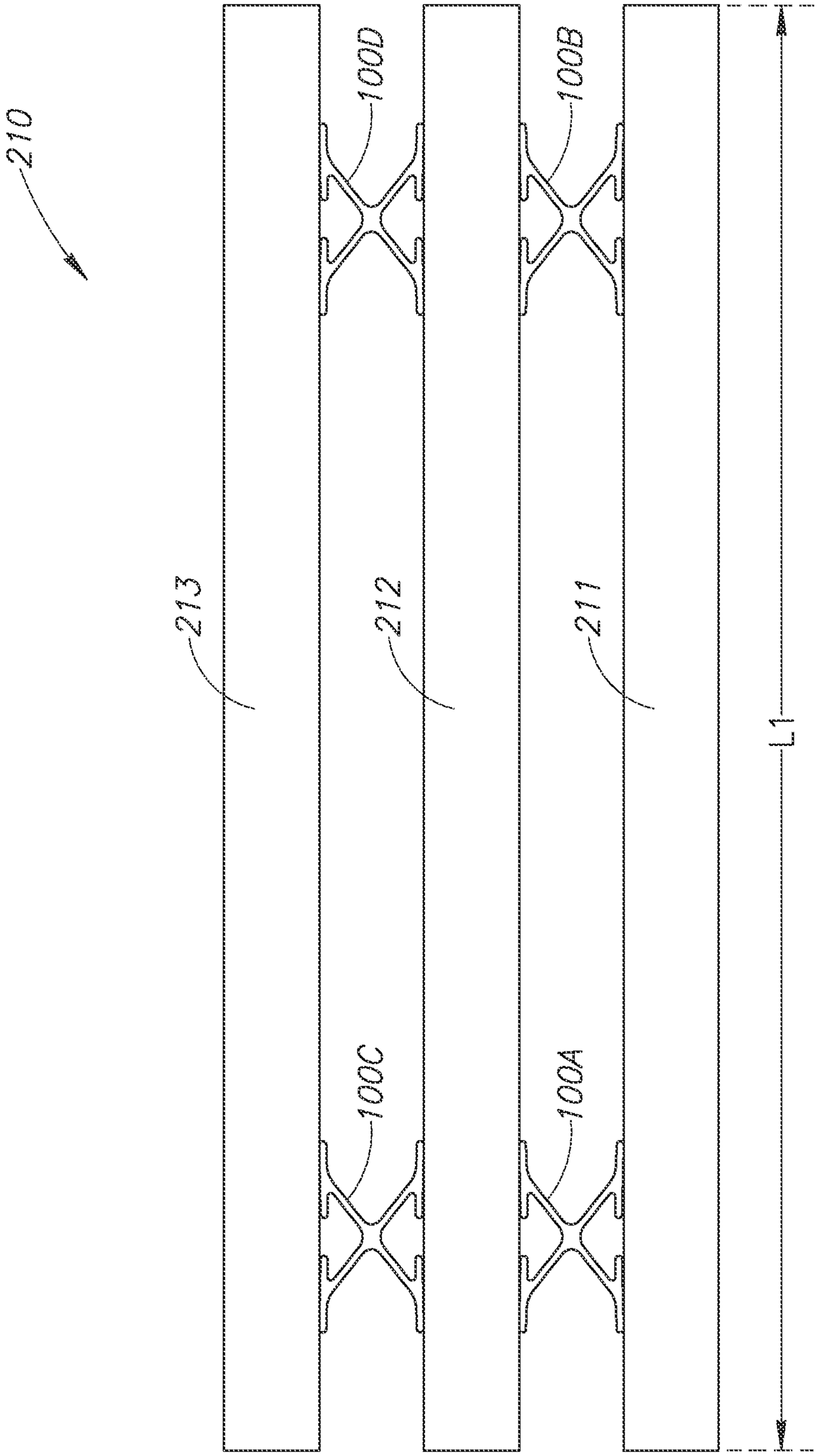


FIG.3

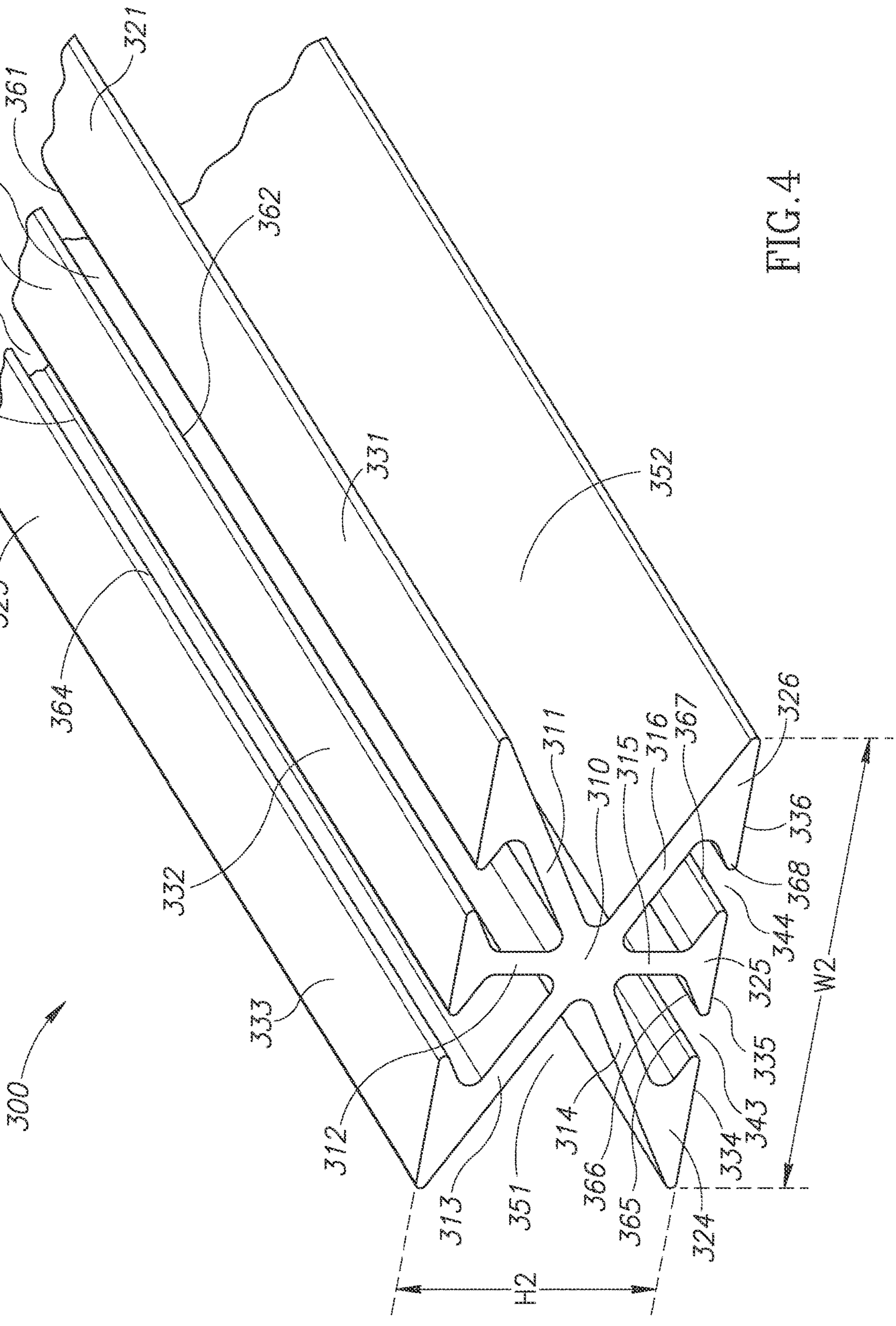

300
312
333
313
351
366
365
324
314
334
343
335
325
344
368
336
326
367
316
315
310
311
332
364
323
363
342
322
341
361
321
362
331
352
H2
W2

FIG. 4

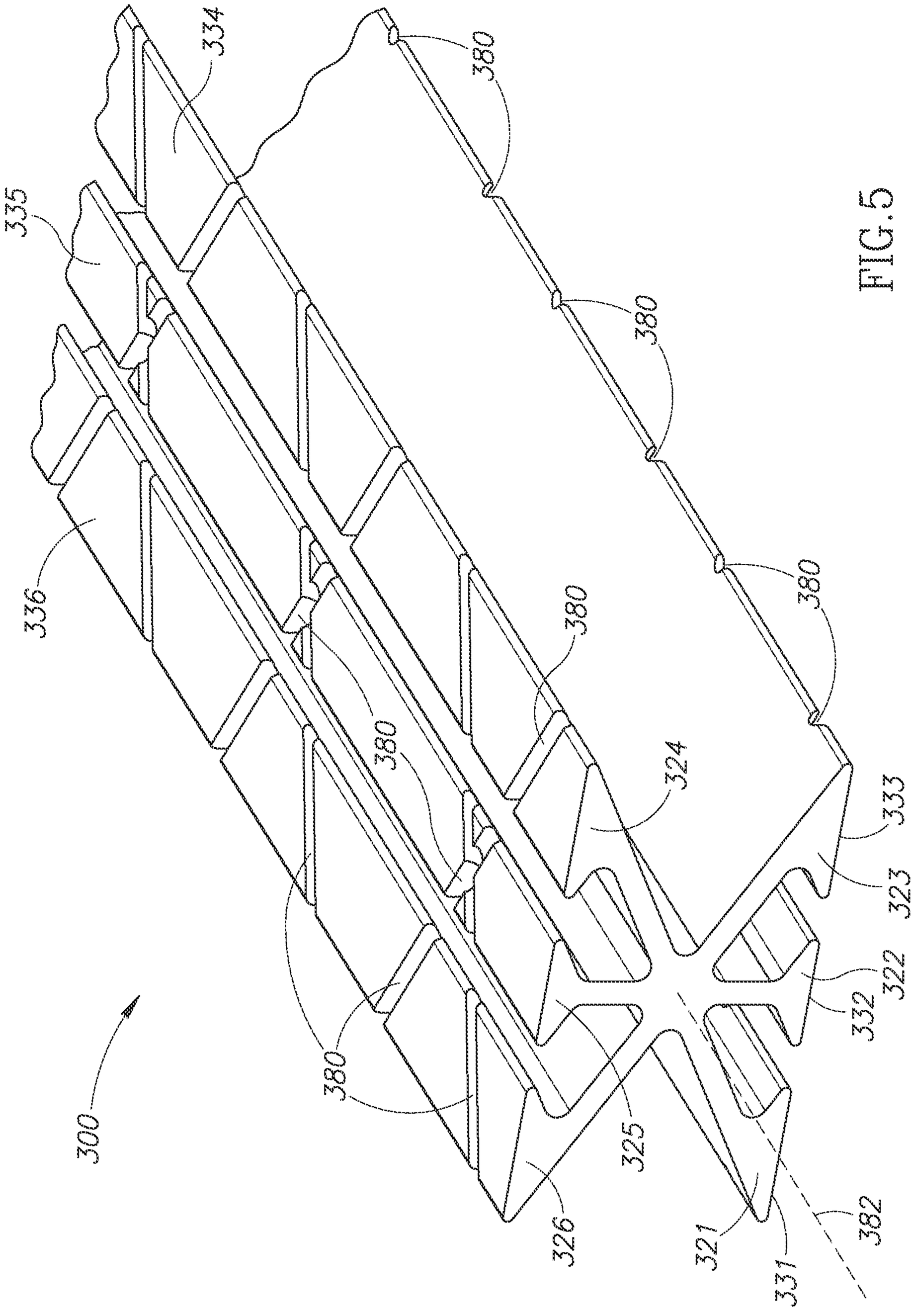

334
380
335
380
336
380
380
324
333
323
322
332
380
325
326
321
331
382
300

FIG. 5

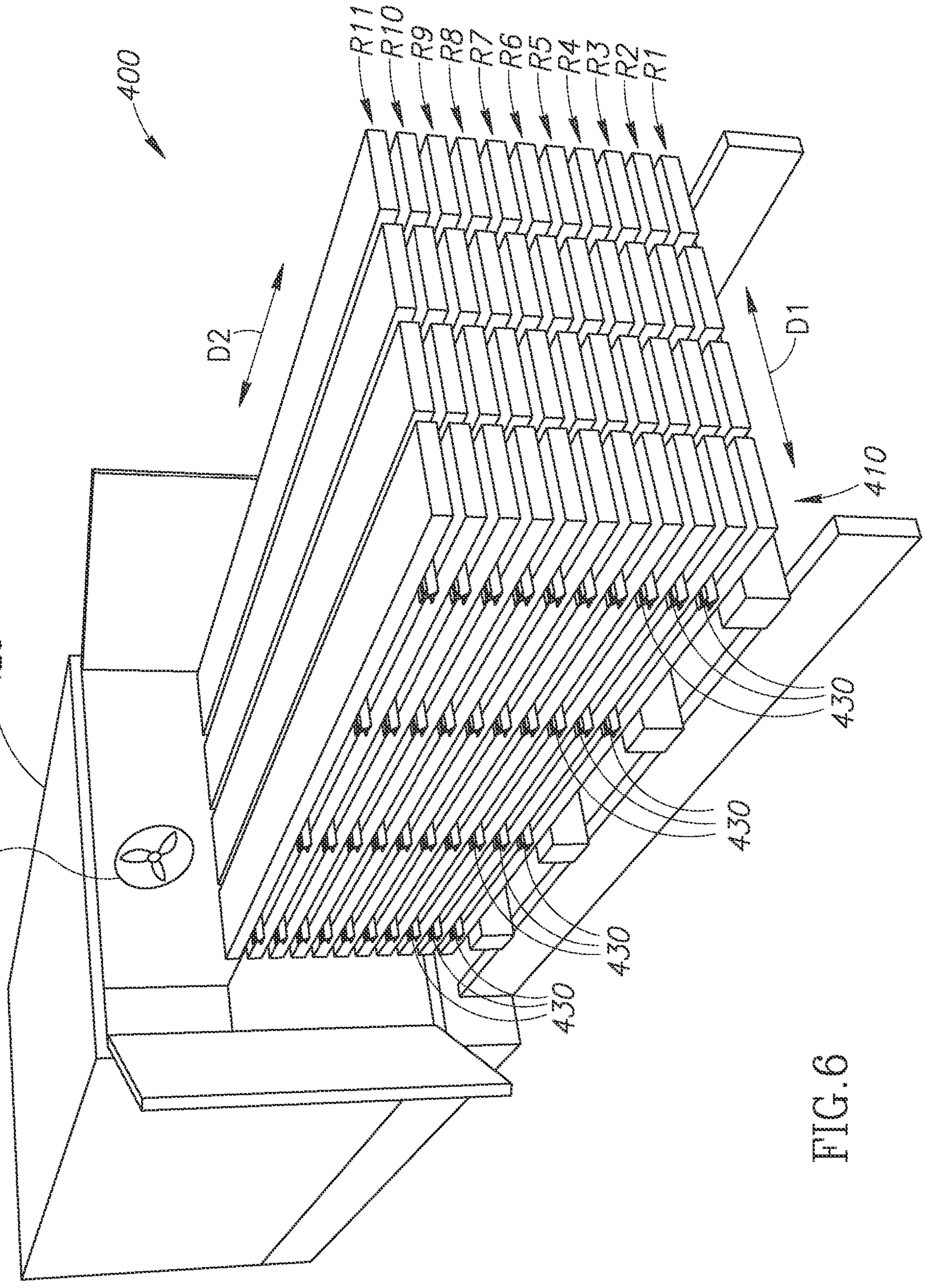

400
R11
R10
R9
R8
R7
R6
R5
R4
R3
R2
R1
D2
D1
410
420
422
430
430
430
430

FIG.6

STICKERS FOR DRYING AND/OR CURING MATERIALS

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention is directed generally to separators and stack stabilizers placed in between boards or sheets stacked atop one another and placed in a kiln or otherwise allowed to dry or cure.

Description of the Related Art

Green lumber must be dried before it can be used as a construction material. Typically, green lumber is stacked and placed in a kiln to dry. Separators and/or stack stabilizers (referred to as "stickers") are placed in between boards stacked atop one another to allow air to circulate in between the boards.

Similarly, many sheet materials (such as cement board) are formed (e.g., extruded), stacked, and allowed to dry or cure. Stickers are placed in between vertically adjacent sheets stacked atop one another to allow air to circulate in between the vertically adjacent sheets.

Stickers are typically constructed from wood. A common problem caused by conventional wooden stickers is "sticker stain" or "sticker shadow" (referred to hereafter as "sticker stain"), which is a stain on the wood or sheet material caused by uneven drying or curing. Sticker stain typically appears at those locations whereat stickers contacted the wood or sheet during drying or curing. Further, because mold can grow on and in wooden stickers, after becoming contaminated with mold (e.g., by lumber), the contaminated stickers can transfer that mold to other materials during subsequent uses. Thus, wooden stickers can transfer mold (and sticker stain) between different surfaces during consecutive uses. Another problem associated with using conventional wooden stickers is that they may be warped or non-uniform, which causes lumber to warp during drying. Additionally, wooden stickers have a useful life of only about three years. Therefore, a need exists for stickers that avoid one or more of these shortcomings. For example, stickers that avoid causing sticker stain would be particularly desirable, as would stickers that help prevent lumber and sheet materials from warping. The present application provides these and other advantages as will be apparent from the following detailed description and accompanying figures.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S)

FIG. **1** is a perspective view of a first embodiment of a sticker.

FIG. **2** is a perspective view of the sticker of FIG. **1** including optional grooves and rotated 180° about its longitudinal axis.

FIG. **3** is a side view of a stack that includes four stickers like the sticker of FIG. **1**.

FIG. **4** is a perspective view of a second embodiment of a sticker.

FIG. **5** is a perspective view of the sticker of FIG. **4** including optional grooves and rotated 180° about its longitudinal axis.

FIG. **6** is a perspective view of a stack of lumber including a plurality of stickers each like the sticker of FIG. **1**.

Like reference numerals have been used in the figures to identify like components.

DETAILED DESCRIPTION OF THE INVENTION

FIG. **1** depicts a first embodiment of a separator, referred to herein as a sticker **100**. The sticker **100** may also be characterized as being a pack or stack stabilizer. The sticker **100** has a central portion **110** and support arms or members **111-114** that extend radially outwardly from the central portion **110**. By way of a non-limiting example, the sticker **100** may have a width W**1** of about 1.0 inch to about 1.5 inches and a height H**1** of about 0.5 inches to about 1.0 inch. The sticker **100** may have any suitable length (e.g., about 4 feet, about 6 feet, and about 8 feet). In some embodiments, the sticker **100** may have a length from about 42 inches to about 48 inches. By way of a non-limiting example, a plurality of stickers each like the sticker **100** may be manufactured by forming an extrusion that has the cross-sectional shape of the sticker **100** and a maximum length (e.g., about 40 feet). Then, the extrusion may be cut laterally into two or more sections (e.g., each having a length of about 4 feet, about 6 feet, about 8 feet, and the like) with each of the sections being one of the plurality of stickers.

In the embodiment illustrated, the central portion **110** and the support members **111-114** define a generally X-shaped cross-sectional shape. Thus, the support members **111** and **113** are substantially collinear, and the support members **112** and **114** are substantially collinear. Further, an inside angle defined between the support members **111** and **112** is substantially equal to an inside angle defined between the support members **113** and **114**, and an inside angle defined between the support members **111** and **114** is substantially equal to an inside angle defined between the support members **112** and **113**. Further, in the embodiment illustrated, the inside angle defined between the support members **111** and **112** (and the inside angle defined between the support members **113** and **114**) is greater than 90° and the inside angle defined between the support members **111** and **114** (and the inside angle defined between the support members **112** and **113**) is less than 90°. However, these inside angles may be adjusted to achieve a desired cross-sectional shape. For example, each of these inside angles may be about 90°. Alternatively, the inside angle defined between the support members **111** and **112** may be different from the inside angle defined between the support members **113** and **114**, and the inside angle defined between the support members **111** and **114** may be different from the inside angle defined between the support members **112** and **113**.

Each of the support members **111-114** has an end **116** opposite the central portion **110**. Support platforms **121-124** are connected to the ends **116** of the support members **111-114**, respectively. Thus, each of the support platforms **121-124** is spaced part from the central portion **110**. Further, the support members **111-114** may be characterized as terminating at or being terminated by the support platforms **121-124**, respectively. In the embodiment illustrated, each of the central portion **110**, the support members **111-114**, and the support platforms **121-124** is elongated and extends along a longitudinal axis **182** (see FIG. **2**).

The support platforms **121** and **122** have outwardly facing substantially coplanar support surfaces **131** and **132**, respectively. A substantially flat surface of an object may be placed upon both of the support surfaces **131** and **132** at the same time. Alternatively, the support surfaces **131** and **132** may rest upon a substantially flat surface of an object at the same time.

The support platforms **123** and **124** have outwardly facing substantially coplanar support surfaces **133** and **134**, respec-

tively. A substantially flat surface of a material (e.g., a board, a sheet, and the like) may be placed upon both of the support surfaces **133** and **134** at the same time. Alternatively, the support surfaces **133** and **134** may rest upon a substantially flat surface at the same time.

The support surfaces **131** and **132** both face in a first direction, and the support surfaces **133** and **134** both face in a second direction that is opposite the first direction. The support surfaces **131** and **132** are substantially parallel with the support surfaces **133** and **134**. In the embodiment illustrated, the support surfaces **131** and **132** are substantially identical to the support surfaces **134** and **133**, respectively. The sticker **100** may be used with the support surfaces **131** and **132** facing upwardly (and the support surfaces **133** and **134** facing downwardly) or alternatively, with the support surfaces **133** and **134** facing upwardly (and the support surfaces **131** and **132** facing downwardly).

The support platforms **121-124** are spaced apart from one another. An open-ended channel **141** is positioned between and extends longitudinally alongside the support platforms **121** and **122** and the support members **111** and **112**. Similarly, an open-ended channel **142** is positioned between and extends longitudinally alongside the support platforms **123** and **124** and the support members **113** and **114**. Air may flow longitudinally through the open-ended channels **141** and **142** in directions identified by double-headed arrows A**1** and A**2**, respectively. Further, air within the channel **141** may flow laterally outwardly therefrom between the support platforms **121** and **122**. Similarly, air within the channel **142** may flow laterally outwardly therefrom between the support platforms **123** and **124**. The longitudinal airflows through the channels **141** and **142** (identified by the arrows "A**1**" and "A**2**") and the lateral airflows therefrom help avoid sticker stain.

The sticker **100** has a smaller cross-sectional area than a conventional wooden sticker, which has a generally square or rectangular cross-sectional shape. Further, a conventional wooden sticker has continuous upper and lower surfaces. Thus, conventional wooden stickers cannot provide the airflows (identified by the arrows "A**1**" and "A**2**") present when the sticker **100** is used. Further, even if conventional wooden stickers having a width substantially identical to the width W**1** were to be constructed, the upper and lower surfaces of such wooden stickers would contact and cover larger portions of those materials immediately above and below the wooden sticker than would be covered by the support surfaces **131-134** of the sticker **100**. Larger covered portions take longer to dry and are more susceptible to sticker stain. As described above, in the sticker **100**, the channel **141** separates the support surfaces **131** and **132** from one another, and the channel **142** separates the support surfaces **133** and **134** from one another. These separations reduce an amount of the material immediately above the sticker **100** that is covered by the support surfaces **131** and **132** and an amount of the material immediately below the sticker **100** that is covered by the support surfaces **133** and **134** allowing those immediately adjacent (or covered) areas to dry faster and making them less susceptible to sticker stain.

An open-ended side channel **151** is positioned between and extends longitudinally alongside the support platforms **122** and **123** and the support members **112** and **113**. Similarly, an open-ended side channel **152** is positioned between and extends longitudinally alongside the support platforms **121** and **124** and the support members **111** and **114**. Air may flow longitudinally through the side channels **151** and **152** in directions identified by double-headed arrows A**3** and A**4**, respectively.

As shown in FIG. **1**, the channels **141**, **142**, **151**, and **152** are arranged around the central portion **110**. The longitudinal airflows (identified by the arrows "A**1**" to "A**4**") through the channels **141**, **142**, **151**, and **152** and the lateral airflows between the support platforms **121-124** help stacked materials separated by the sticker **100** receive adequate air circulation to facilitate drying and/or curing. This allows the stacked materials (e.g., lumber, cement board, and the like) to dry and/or cure consistently.

In the embodiment illustrated, an inner edge portion **161** of the support platform **121** extends into the open-ended channel **141** and overhangs (or laterally obstructs) a portion of the open-ended channel **141** adjacent the support platform **121**. An outer edge portion **162** of the support platform **121** extends outwardly beyond the support member **111** and extends the side channel **152** outwardly beyond the support members **111** and **114**. In other words, the inner and outer edge portions **161** and **162** may be characterized as being cantilevered with respect to the support member **111**.

In the embodiment illustrated, an inner edge portion **163** of the support platform **122** extends into the open-ended channel **141** and overhangs (or laterally obstructs) a portion of the open-ended channel **141** adjacent the support platform **122**. An outer edge portion **164** of the support platform **122** extends outwardly beyond the support member **112** and extends the open-ended side channel **151** outwardly beyond the support members **112** and **113**. In other words, the inner and outer edge portions **163** and **164** may be characterized as being cantilevered with respect to the support member **112**.

In the embodiment illustrated, an inner edge portion **171** of the support platform **123** extends into the open-ended channel **142** and overhangs (or laterally obstructs) a portion of the open-ended channel **142** adjacent the support platform **123**. An outer edge portion **172** of the support platform **123** extends outwardly beyond the support member **113** and extends the open-ended side channel **151** outwardly beyond the support members **112** and **113**. In other words, the inner and outer edge portions **171** and **172** may be characterized as being cantilevered with respect to the support member **113**.

In the embodiment illustrated, an inner edge portion **173** of the support platform **124** extends into the open-ended channel **142** and overhangs (or laterally obstructs) a portion of the open-ended channel **142** adjacent the support platform **124**. An outer edge portion **174** of the support platform **124** extends outwardly beyond the support member **114** and extends the side channel **152** outwardly beyond the support members **111** and **114**. In other words, the inner and outer edge portions **173** and **174** may be characterized as being cantilevered with respect to the support member **114**.

FIG. **2** depicts an embodiment of the sticker **100** that includes optional airflow (or cross ventilation) cuts or grooves **180** formed in each of the support surfaces **131-134**. Each of the airflow grooves **180** opens into at least one of the channels **141**, **142**, **151**, and **152**. Air may flow into the airflow grooves **180** (e.g., from one or more of the channels **141**, **142**, **151**, and **152** or outside the sticker **100**) to help evaporate any liquids or moisture adjacent or alongside the grooves **180**. While the airflow grooves **180** have been illustrated as extending at an angle other than perpendicular to or parallel with the longitudinal axis **182** of the sticker **100**, in alternate embodiments, the airflow grooves **180** may be substantially perpendicular to the longitudinal axis **182**. By way of another non-limiting example, the airflow grooves **180** may extend longitudinally (or substantially parallel to the longitudinal axis **182**). Further, the airflow

grooves **180** may be tapered or non-linear. Air flowing through the airflow grooves **180** may create vortices or turbulence that helps prevent sticker stain. Further, air flowing through the airflow grooves **180** helps increase a rate at which materials immediately adjacent to the sticker **100** dry and/or cure.

An amount of weight that the sticker **100** may support is determined at least in part by the thickness of the central portion **110**, the support members **111-114**, and the support platforms **121-124**. Thus, the sticker **100** may be made stronger (and able to support more weight) by increasing the thickness of the central portion **110**, the support members **111-114**, and/or the support platforms **121-124**.

FIG. **3** is a side view of a stack **210** formed by stickers **100**A-**100**D and items **211-213**. Each of the stickers **100**A-**100**D is like the sticker **100**. The items **211-213** may each be a wooden board, a sheet material, and the like. For example, the items **211-213** may be cement boards or similar sheet materials that dry and/or cure.

In the stack **210**, the stickers **100**A and **100**B are positioned in between the second item **212** stacked atop the first item **211**, and the stickers **100**C and **100**D are depicted positioned in between the third item **213** stacked atop the second item **212**. The stickers **100**A-**100**D separate vertically adjacent items in the stack **210** and help stabilize the stack **210**. While FIG. **3** depicts only two stickers (e.g., the stickers **100**A and **100**B) positioned between each pair of vertically adjacent items (e.g., the items **211** and **212**) in the stack **210**, any number of stickers may be used. For example, when the items **211-213** are lumber, the items **211-213** may have a length "L**1**" of approximately 20 feet. In such embodiments, more than two stickers like the sticker **100** may be used in between each vertically adjacent pair of boards in the stack **210**.

Referring to FIG. **1**, the support members **111-114** and/or the support platforms **121-124** are each configured to flex, twist, bend, and/or otherwise elastically deform laterally and/or longitudinally when a sufficient amount of force is applied thereto. Further, the sticker **100** may flex, twist, bend, and/or otherwise elastically deform longitudinally to conform to any materials (e.g., the items **211-213** depicted in FIG. **3**) stacked thereupon. Thus, the sticker **100** avoids denting or otherwise damaging such materials. Additionally, while the sticker **100** may flex and/or deflect longitudinally, the sticker **100** resists such deflection and tries to return to its original shape. For example, along its length, the sticker **100** is substantially straight and after deflecting laterally, returns to being substantially straight. Thus, the sticker **100** pushes against those materials with which it has been stacked to help keep those materials substantially straight and/or flat. In other words, the sticker **100** helps prevent materials (e.g., lumber, cement board, and the like) from warping. For example, referring to FIG. **3**, the sticker **100** pushes against the items **211-213** and helps keep them substantially straight and/or flat.

While the support surfaces **131-134** have been described and illustrated as being substantially planar, in alternate embodiments, the support surfaces **131-134** may each be contoured. Such contours may help the support platforms **121-124** better conform to the materials adjacent the sticker **100** within a stack to reduce damage (e.g., dents) to those materials caused by the sticker **100**. For example, each of the support surfaces **131-134** may be concave (or cupped) such the inner and outer edge portions **161** and **162** of the support platform **121** curve outwardly away from the support member **111**, the inner and outer edge portions **163** and **164** of the support platform **122** curve outwardly away from the support member **112**, the inner and outer edge portions **171** and **172** of the support platform **123** curve outwardly away from the support member **113**, and the inner and outer edge portions **173** and **174** of the support platform **124** curve outwardly away from the support member **114**.

FIG. **4** depicts a second embodiment of a sticker **300**. The sticker **300** has a central portion **310** and support arms or members **311-316** that extend radially outwardly from the central portion **310**. By way of a non-limiting example, the sticker **300** may have a width W**2** of about 1.0 inch to about 1.5 inches and a height H**2** of about 0.5 inches to about 1.0 inch. The sticker **300** may have any length discussed above as being suitable for constructing the sticker **100** (see FIGS. **1-3**). Further, the sticker **300** may be constructed in the same manner and using the same materials as the sticker **100** (see FIGS. **1-3**).

The outwardly extending support members **311-316** are terminated by support platforms **321-326**, respectively. Thus, the support platforms **321-326** are spaced apart from the central portion **310** and one another. The support platform **322** is positioned between the support platforms **321** and **323**, and the support platform **325** is positioned between the support platforms **324** and **326**.

The support platforms **321-323** have outwardly facing coplanar support surfaces **331-333**, respectively. A substantially flat surface of an object may be placed upon all of the support surfaces **331-333** at the same time. Alternatively, the support surfaces **331-333** may rest upon a substantially flat surface of an object at the same time.

The support platforms **324-326** have outwardly facing coplanar support surfaces **334-336**, respectively. A substantially flat surface of a material (e.g., a board, a sheet, and the like) may be placed upon all of the support surfaces **334-336** at the same time. Alternatively, the support surfaces **334-336** may rest upon a substantially flat surface at the same time.

The support surfaces **331-333** all face a first direction, and the support surfaces **334-336** all face in a second direction that is opposite the first direction. The support surfaces **331-333** are substantially parallel with the support surfaces **334-336**. In the embodiment illustrated, the support surfaces **331-333** are substantially identical to the support surfaces **336-334**, respectively. The sticker **300** may be used with the support surfaces **331-333** facing upwardly (and the support surfaces **334-336** facing downwardly) or alternatively, with the support surfaces **334-336** facing upwardly (and the support surfaces **331-333** facing downwardly).

Together the central portion **310** and the support members **311**, **313**, **314**, and **316** have a cross-section shape that is substantially similar to that of the central portion **110** (see FIG. **1**) and the support members **111-114** (see FIGS. **1** and **2**) of the sticker **100** (see FIGS. **1-3**). In the embodiment illustrated, the central portion **310** and the support members **311**, **313**, **314**, and **316** have been depicted as having a generally X-shaped cross-section shape. However, as explained above with respect to the sticker **100**, this is not a requirement.

In the embodiment illustrated, the support members **312** and **315** are substantially collinear with each of the support members **312** and **315** being substantially vertical and substantially planar. Further, each of the support platforms **322** and **325** has a substantially horizontal orientation. Together, the central portion **310**, the support members **312** and **315**, and the support platforms **322** and **325** have an I-beam shaped cross-sectional shape that provides additional strength beyond that provided by the central portion **310**, the support members **311**, **313**, **314**, and **316** and the support platforms **321**, **323**, **324**, and **326** alone. Thus, the sticker

300 may support more weight (and, therefore, be used to construct taller stacks) than the sticker 100 (see FIGS. 1-3). Further, the sticker 300 may be used to stack thicker and/or heavier materials. However, depending upon the implementation details, the sticker 300 may require more material (e.g., aluminum, aluminum alloy, plastic, and the like) to manufacture than the sticker 100. The sticker 300 may be made stronger by increasing the thickness of the central portion 310, the support members 311-316, and/or the support platforms 321-326.

An open-ended channel 341 is positioned between and extends longitudinally alongside the support platforms 321 and 322 and the support members 311 and 312. Similarly, an open-ended channel 342 is positioned between and extends longitudinally alongside the support platforms 322 and 323 and the support members 312 and 313. Further, an open-ended channel 343 is positioned between and extends longitudinally alongside the support platforms 324 and 325 and the support members 314 and 315. Additionally, an open-ended channel 344 is positioned between and extends longitudinally alongside the support platforms 325 and 326 and the support members 315 and 316.

Air may flow longitudinally through the open-ended channels 341-344. Further, air within the channel 341 may flow laterally outwardly therefrom between the support platforms 321 and 322, and air within the channel 342 may flow laterally outwardly therefrom between the support platforms 322 and 323. Similarly, air within the channel 343 may flow laterally outwardly therefrom between the support platforms 324 and 325, and air within the channel 344 may flow laterally outwardly therefrom between the support platforms 325 and 326. The longitudinal airflows through the channels 341-344 and the lateral airflows therefrom help avoid sticker stain.

As discussed above, with respect to the sticker 100 (see FIGS. 1-3), conventional wooden stickers that have a generally square or rectangular cross-sectional shape with continuous upper and lower surfaces cannot provide airflows through channels (like the channels 341-344). Further, these upper and lower surfaces contact and cover larger portions of those materials immediately above and below the wooden sticker than would be covered by the support surfaces 331-336 of the sticker 300. The sticker 300 reduces dry time and/or reduces and/or eliminates sticker stain because the channel 341 separates the support surfaces 331 and 332 from one another, the channel 342 separates the support surfaces 332 and 333 from one another, the channel 343 separates the support surfaces 334 and 335 from one another, and the channel 344 separates the support surfaces 335 and 336 from one another. These separations reduce an amount of the material immediately above the sticker 300 that is covered by the support surfaces 331-333 and an amount of the material immediately below the sticker 300 that is covered by the support surfaces 334-336 allowing those immediately adjacent (or covered) areas to dry faster and making them less susceptible to sticker stain.

An open-ended side channel 351 is positioned between and extends longitudinally alongside the support platforms 323 and 324 and the support members 313 and 314. Similarly, an open-ended side channel 352 is positioned between and extends longitudinally alongside the support platforms 321 and 326 and the support members 311 and 316. Air may flow longitudinally through the open-ended side channels 351 and 352.

As shown in FIG. 4, the channels 341-344, 351, and 352 are arranged around the central portion 310. The longitudinal airflows through the channels 341-344, 351, and 352 and the lateral airflows between the support platforms 321-326 help stacked materials separated by the sticker 300 receive adequate air circulation to facilitate drying and/or curing. This allows the stacked materials (e.g., lumber, cement board, and the like) to dry and/or cure consistently.

In the embodiment illustrated, an inner edge portion 361 of the support platform 321 extends into the open-ended channel 341 and overhangs (or laterally obstructs) a portion of the open-ended channel 341 adjacent the support platform 321. In other words, the inner edge portion 361 may be characterized as being cantilevered with respect to the support member 311.

In the embodiment illustrated, a longitudinally extending first edge portion 362 of the support platform 322 extends into the open-ended channel 341 and overhangs (or laterally obstructs) a portion of the open-ended channel 341 adjacent the support platform 322, and a longitudinally extending second edge portion 363 of the support platform 322 extends into the open-ended channel 342 and overhangs (or laterally obstructs) a portion of the open-ended channel 342 adjacent the support platform 322. In other words, the first and second edge portions 362 and 363 may be characterized as being cantilevered with respect to the support member 312.

In the embodiment illustrated, an inner edge portion 364 of the support platform 323 extends into the open-ended channel 342 and overhangs (or laterally obstructs) a portion of the open-ended channel 342 adjacent the support platform 323. In other words, the inner edge portion 364 may be characterized as being cantilevered with respect to the support member 313.

In the embodiment illustrated, an inner edge portion 365 of the support platform 324 extends into the open-ended channel 343 and overhangs (or laterally obstructs) a portion of the open-ended channel 343 adjacent the support platform 324. In other words, the inner edge portion 365 may be characterized as being cantilevered with respect to the support member 314.

In the embodiment illustrated, a longitudinally extending first edge portion 366 of the support platform 325 extends into the open-ended channel 343 and overhangs (or laterally obstructs) a portion of the open-ended channel 343 adjacent the support platform 325, and a longitudinally extending second edge portion 367 of the support platform 325 extends into the open-ended channel 344 and overhangs (or laterally obstructs) a portion of the open-ended channel 344 adjacent the support platform 325. In other words, the first and second edge portions 366 and 367 may be characterized as being cantilevered with respect to the support member 315.

In the embodiment illustrated, an inner edge portion 368 of the support platform 326 extends into the open-ended channel 344 and overhangs (or laterally obstructs) a portion of the open-ended channel 344 adjacent the support platform 326. In other words, the inner edge portion 368 may be characterized as being cantilevered with respect to the support member 316.

Like the sticker 100 (see FIG. 1-3), the sticker 300 may flex and/or deflect longitudinally. Along its length, the sticker 300 is substantially straight and after deflecting laterally, returns to being substantially straight. Further, the sticker 300 resists such deflection and tries to return to its original shape. Thus, the sticker 300 pushes against those materials with which it has been stacked to help keep those materials substantially straight and/or flat. In other words, the sticker 300 helps prevent materials (e.g., lumber, cement board, and the like) from warping.

FIG. 5 depicts an embodiment of the sticker 300 that includes optional airflow (or cross ventilation) cuts or

grooves **380** formed in each of the support surfaces **331-336**. Each of the airflow grooves **380** opens into at least one of the channels **341-344**, **351**, and **352**. In the embodiment illustrated, the grooves **380** are arranged in longitudinally repeating X-shaped patterns. Air may flow into the airflow grooves **380** (e.g., from one or more of the channels **341-344**, **351**, and **352** or outside the sticker **300**) to help evaporate any liquids or moisture adjacent or alongside the grooves **380**. While the airflow grooves **380** have been illustrated as extending at angles other than perpendicular to or parallel with a longitudinal axis **382** of the sticker **300**, in alternate embodiments, the airflow grooves **380** may be substantially perpendicular to the longitudinal axis **382**. By way of another non-limiting example, the airflow grooves **380** may extend longitudinally (or substantially parallel to the longitudinal axis **382**). Further, the airflow grooves **380** may be tapered or non-linear. Air flowing through the airflow grooves **380** may create vortices or turbulence that helps prevent sticker stain. Further, air flowing through the airflow grooves **380** helps increase a rate at which materials immediately adjacent to the sticker **300** dry and/or cure.

FIG. **6** depicts a stack **400** ready to be placed inside a kiln **420**. The stack **400** includes a plurality of spaced apart stickers **430** that each extends longitudinally along a first direction (identified by a double headed arrow "D**1**"), and a plurality of boards **410** that each extends longitudinally along a second direction (identified by a double headed arrow "D**2**").

The stack **400** may be characterized as including a plurality of vertically stacked rows R**1**-R**11**. Vertically adjacent pairs of the rows R**1**-R**11** are separated from one another by two or more of the stickers **430** spaced apart from one another along the second direction (identified by the double-headed arrow "D**2**"). Within each of the rows R**2**-R**11**, one or more of the boards **410** are arranged along the first direction (identified by the double-headed arrow "D**1**") and stacked upon two or more of the sticker **430**. For example, in FIG. **6**, within each of the rows R**2**-R**11**, four of the boards **410** are stacked upon four of the stickers **430** (that are spaced apart from one another along the second direction). Within each of the rows R**1**-R**11**, those boards within the row (e.g., the row R**11**) may be spaced apart from one another along the first direction (identified by the double headed arrow "D**1**") to allow air to flow in between them.

The stack **400** may be constructed by positioning one or more of the boards **410** to extend along the second direction and define the row R**1**. Then, at least two of the stickers **430** (oriented to extend along the first direction) are positioned directly on top of boards of the row R**1**. Next, the row R**2** is defined by positioning one or more of the boards **410** (oriented to extend along the second direction) directly on top of those stickers positioned on top of the row R**1**. The rows R**3**-R**11** may be added to the stack **400** by alternatingly adding at least two of the stickers **430** (oriented to extend along the first direction) and one or more of the boards **410** (oriented to extend along the second direction) to the stack **400**.

In FIG. **6**, each of the stickers **430** has been illustrated as being an implementations of the sticker **100** (see FIG. **1-3**). However, each of the stickers **430** could be implemented using the sticker **300** instead. Further, a first portion of the stickers **430** could each be implemented using the sticker **100**, and a second portion of the stickers **430** could each be implemented using the sticker **300**.

As explained above, the stickers **100** and **300** may include the grooves **180** and **380**, respectively. In such embodiments, the grooves **180** and **380** provide cross ventilation that allows air to pass alongside the boards **410** at those locations whereat the stickers **430** contact the boards. Thus, air is able to pass through the stack **400**, alongside the boards **410** (even where the boards **410** contact the stickers **430**), and reduce sticker stain on the boards **410**.

The kiln **420** may include one or more fans **422** configured to circulate air inside the kiln **420**. After the stack **400** is placed inside the kiln **420**, the drying and/or curing process begins. During the drying and/or curing process, a temperature inside the kiln **420** may be increased and/or the one or more fans **422** may be activated to blow air toward the stack **400**. Air (e.g., circulated by the one or more fans **422**) travels between the boards **410** and through the channels (e.g., the channels **141**, **142**, **151**, and **152** of the sticker **100** or the channels **341-344**, **351**, and **352** of the sticker **300**) of the stickers **430**. Further, the air may travel through the airflow grooves (e.g., the airflow grooves **180** of the sticker **100** or the airflow grooves **380** of the sticker **300**) of the stickers **430**, if present.

When the boards **410** are dry, the stack **400** is removed from the kiln **420**.

As mentioned above, conventional wooden stickers absorb (or wick) moisture. Additionally, conventional wooden stickers often contain tree sap, which promotes the growth of mold. In contrast, the stickers **100** and **300** are constructed from a material that does not absorb (or wick) moisture. Additionally, the stickers **100** and **300** may be constructed from a material that resists mold and/or does not provide a growth medium (e.g., wood, sap, and the like) for mold. Thus, the stickers **100** and **300** help avoid sticker stain. By way of a non-limiting example, the stickers **100** and **300** may be constructed from a material other than solid wood, such as an inorganic material. By way of additional non-limiting examples, the stickers **100** and **300** may be constructed from aluminum, a material that includes aluminum (e.g., an aluminum alloy), plastic, carbon fiber, and the like. Non-limiting examples of suitable aluminum alloys that may be used to construct the stickers **100** and **300** include 6063-T6 and A6005.

By way of a non-limiting example, aluminum or an aluminum alloy may be extruded to form the stickers **100** and **300**. By using aluminum or an aluminum alloy, the stickers **100** and **300** may have improved uniformity (both in terms of flatness and straightness) compared to conventional wooden stickers. Thus, the materials stacked upon and separated by a plurality of the stickers **100** and/or the stickers **300** will dry or cure straighter and/or flatter. This helps improve productivity and/or yield of a processing facility and allows the materials to be manufactured with closer tolerances. Further, the stickers **100** and **300** may have better dimensional stability and strength compared to conventional wooden stickers. This allows the stickers **100** and **300** to return to their original shape even after being subjected to multiple cycles of the drying and/or curing process, each of which subjects the stickers **100** and **300** to heat, moisture, and pressure.

Air may flow more consistently (e.g., at a more consistent speed) through materials stacked using the stickers **100** and **300** than through materials stacked using conventional wooden stickers because the stickers **100** and **300** are straighter and/or flatter. Thus, more consistent pathways for airflows are defined within the stack (e.g., the stack **210**, the stack **400**, and the like). Referring to FIG. **6**, when two or more substantially similar stacks are placed inside the kiln **420**, those stacks will have dimensions that are more consistent. Thus, the stacks may be better aligned with one

another inside the kiln **420**. This allows for smoother and/or more consistent airflow through, between, and around the stacks.

As is appreciated by those of ordinary skill in the art, conventional wood stickers and separators tend to absorb moisture and require additional drying prior to the main drying process. An amount of energy required to dry materials (e.g., lumber) may be reduced by using a material (e.g., aluminum, an aluminum alloy, and the like) to construct the stickers **100** and **300** that does not absorb (or wick) moisture and has suitable heat transfer characteristics. Using a material (e.g., aluminum, an aluminum alloy, and the like) to construct the stickers **100** and **300** that provides a heat transfer rate (or thermal conductivity) that is greater than that of wood helps reduce the amount of energy needed to dry and/or cure materials, and helps bring the temperature of those materials up to a desired temperature more quickly.

Using a material (e.g., aluminum, an aluminum alloy, and the like) to construct the stickers **100** and **300** that does not absorb (or wick) moisture helps reduce the size of the thermal mass that needs to be heated to effectuate the drying process because the stickers **100** and **300** themselves do not need to dry. Further, when the stickers **100** and **300** are constructed using aluminum or an aluminum alloy, they can withstand higher temperatures than conventional wooden stickers.

When the stickers **100** and **300** are constructed using a material that includes aluminum (e.g., aluminum, an aluminum alloy, and the like) the stickers **100** and **300** may be lighter in weight than conventional wooden stickers.

Conventional wooden stickers have rough outer surfaces. Airflow within and alongside the stickers **100** and **300** may be improved by constructed them using a material (e.g., aluminum, an aluminum alloy, and the like) and/or process (e.g., extrusion) that provides finished (or substantially smooth) surfaces. Such surfaces also help avoid injuries to users that may be caused by sharp edges and/or slivers that may be present in wooden stickers.

Unlike conventional wooden stickers and separators, which can lose their strength and dimensional stability, the stickers **100** and **300** may be constructed using a recycled and recyclable material (e.g., aluminum, an aluminum alloy, and the like) that has a much longer useful life. When the stickers **100** and **300** are worn out, damaged, or otherwise rendered unusable, the stickers **100** and **300** may be recycled and new stickers **100** and **300** constructed from the recycled material.

Because of the qualities described above, the stickers **100** and **300** may be used to implement an improved drying and/or curing process that is faster, more uniform, and uses less energy than prior art drying and/or curing processes. Further, the improved drying and/or curing process may produce an end product (e.g., lumber, cement board, and the like) that is flatter and more uniform than can be achieved by prior art drying and/or curing processes.

The foregoing described embodiments depict different components contained within, or connected with, different other components. It is to be understood that such depicted architectures are merely exemplary, and that in fact many other architectures can be implemented which achieve the same functionality. In a conceptual sense, any arrangement of components to achieve the same functionality is effectively "associated" such that the desired functionality is achieved. Hence, any two components herein combined to achieve a particular functionality can be seen as "associated with" each other such that the desired functionality is achieved, irrespective of architectures or intermedial components. Likewise, any two components so associated can also be viewed as being "operably connected," or "operably coupled," to each other to achieve the desired functionality.

While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that, based upon the teachings herein, changes and modifications may be made without departing from this invention and its broader aspects and, therefore, the appended claims are to encompass within their scope all such changes and modifications as are within the true spirit and scope of this invention. Furthermore, it is to be understood that the invention is solely defined by the appended claims. It will be understood by those within the art that, in general, terms used herein, and especially in the appended claims (e.g., bodies of the appended claims) are generally intended as "open" terms (e.g., the term "including" should be interpreted as "including but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes but is not limited to," etc.). It will be further understood by those within the art that if a specific number of an introduced claim recitation is intended, such an intent will be explicitly recited in the claim, and in the absence of such recitation no such intent is present. For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim recitation to inventions containing only one such recitation, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an" (e.g., "a" and/or "an" should typically be interpreted to mean "at least one" or "one or more"); the same holds true for the use of definite articles used to introduce claim recitations. In addition, even if a specific number of an introduced claim recitation is explicitly recited, those skilled in the art will recognize that such recitation should typically be interpreted to mean at least the recited number (e.g., the bare recitation of "two recitations," without other modifiers, typically means at least two recitations, or two or more recitations).

Accordingly, the invention is not limited except as by the appended claims.

The invention claimed is:

1. A separator comprising:

an elongated central portion extending along a longitudinal axis;

a plurality of support members extending radially outwardly from the elongated central portion, the plurality of support members comprising first, second, third, and fourth support members;

a plurality of open-ended channels each defined between a different adjacent pair of the plurality of support members, each of the plurality of open-ended channels extending along the longitudinal axis and being configured to allow air to flow therethrough, the plurality of open-ended channels comprising first, second, third, and fourth open-ended channels, the first open-ended channel being positioned between the first and second support members, the second open-ended channel being positioned between the third and fourth support members, the third open-ended channel being positioned between the second and third support members, the fourth open-ended channel being positioned between the first and fourth support members; and

a plurality of support platforms comprising first, second, third, and fourth support platforms, the first support platform comprising a longitudinally extending first inner edge opposite a longitudinally extending first outer edge, the first support member being connected to the first support platform between the first inner edge and the first outer edge, the first support platform having an outwardly facing first support surface that extends from the first inner edge to the first outer edge, the first support surface comprising first grooves that extend laterally across the first support surface from the first outer edge to the first inner edge, the second support platform comprising a longitudinally extending second inner edge opposite a longitudinally extending second outer edge, the second support member being connected to the second support platform between the second inner edge and the second outer edge, the second support platform having an outwardly facing second support surface that extends from the second inner edge to the second outer edge, the second support surface comprising second grooves that extend laterally across the second support surface from the second outer edge to the second inner edge, the third support platform comprising a longitudinally extending third inner edge opposite a longitudinally extending third outer edge, the third support member being connected to the third support platform between the third inner edge and the third outer edge, the third support platform having an outwardly facing third support surface that extends from the third inner edge to the third outer edge, the third support surface comprising third grooves that extend laterally across the third support surface from the third outer edge to the third inner edge, the fourth support platform comprising a longitudinally extending fourth inner edge opposite a longitudinally extending fourth outer edge, the fourth support member being connected to the fourth support platform between the fourth inner edge and the fourth outer edge, the fourth support platform having an outwardly facing fourth support surface that extends from the fourth inner edge to the fourth outer edge, the fourth support surface comprising fourth grooves that extend laterally across the fourth support surface from the fourth outer edge to the fourth inner edge, the first, second, third, and fourth grooves being configured to allow air to flow therethrough,

the first and second support platforms extending toward one another with the first and second inner edges defining a first opening into the first open-ended channel, the third and fourth support platforms extending toward one another with the third and fourth inner edges defining a second opening into the second open-ended channel,

the second and third support platforms defining a longitudinally extending third opening into the third open-ended channel, a first distance being defined between the second and third support platforms at the third opening, the first distance being greater than a distance defined between the second and third support members within the third open-ended channel,

the first and fourth support platforms defining a longitudinally extending fourth opening into the fourth open-ended channel, a second distance being defined between the first and fourth support platforms at the fourth opening, the second distance being greater than a distance defined between the first and fourth support members within the fourth open-ended channel.

2. The separator of claim **1** constructed from a material having a higher thermal conductivity than wood.

3. The separator of claim **1**, wherein together the elongated central portion and at least a portion of the plurality of support members have an X-shaped cross-sectional shape.

4. The separator of claim **1**, wherein the plurality of support members comprises fifth and sixth support members,

the fifth support member is positioned between the first and second support members,

the sixth support member is positioned between the third and fourth support members, and

the fifth and sixth support members are both substantially vertical and substantially collinear.

5. The separator of claim **4**, wherein a fifth support platform is connected to the fifth support member, and

a sixth support platform is connected to the sixth support member such that together the elongated central portion, the fifth and sixth support members, and the fifth and sixth support platforms have an I-beam shaped cross-sectional shape.

6. The separator of claim **5**, wherein together the elongated central portion and the first, second, third, and fourth support members have an X-shaped cross-sectional shape.

7. The separator of claim **1**, wherein the elongated central portion, the plurality of support members, and the plurality of support platforms are each constructed entirely of a material that includes aluminum.

8. The separator of claim **1**, wherein the elongated central portion, the plurality of support members, and the plurality of support platforms are each constructed entirely of aluminum or an aluminum alloy.

9. The separator of claim **1**, wherein the first grooves are configured to receive first air from outside one or both of the first outer edge and the first inner edge, the first grooves allowing the first air to flow therethrough to help evaporate any liquids or moisture adjacent or alongside the first grooves,

the second grooves are configured to receive second air from outside one or both the second outer edge and the second inner edge, the second grooves allowing the second air to flow therethrough to help evaporate any liquids or moisture adjacent or alongside the second grooves,

the third grooves are configured to receive third air from outside one or both of the third outer edge and the third inner edge, the third grooves allowing the third air to flow therethrough to help evaporate any liquids or moisture adjacent or alongside the third grooves, and

the fourth grooves are configured to receive fourth air from outside one or both of the fourth outer edge and the fourth inner edge, the fourth grooves allowing the fourth air to flow therethrough to help evaporate any liquids or moisture adjacent or alongside the fourth grooves.

10. The separator of claim **9**, wherein the first, second, third, and fourth grooves are configured such that the first, second, third, and fourth air create vortices or turbulence that helps prevent sticker stain.

11. The separator of claim **1**, wherein the first grooves define first X-shaped patterns on the first support surface,

the second grooves define second X-shaped patterns on the second support surface,

the third grooves define third X-shaped patterns on the third support surface, and

the fourth grooves define fourth X-shaped patterns on the fourth support surface.

12. The separator of claim 1, wherein

the first and second support surfaces are configured to rest upon a first item in a stack, and

the third and fourth support surfaces are configured to support a different second item in the stack.

13. The separator of claim 1, wherein the first, second, third, and fourth grooves are configured such that air flowing therethrough creates vortices or turbulence that helps prevent sticker stain.

14. A sticker comprising:

an elongated central portion that extends along a longitudinal axis;

first, second, third, and fourth support members that extend radially outwardly from the elongated central portion;

first, second, third, and fourth support platforms connected to the first, second, third, and fourth support members, respectively, the first, second, third, and fourth support platforms having outwardly facing first, second, third, and fourth support surfaces, respectively, the first, second, third, and fourth support surfaces having first, second, third, and fourth grooves, respectively, formed therein, each of the first, second, third, and fourth support platforms having an inner edge portion opposite an outer edge portion, the first grooves extending laterally across the first support surface from the inner edge portion of the first support platform to the outer edge portion of the first support platform, the first support member being connected to the first support platform between the inner edge portion of the first support platform and the outer edge portion of the first support platform, the second support member being connected to the second support platform between the inner edge portion of the second support platform and the outer edge portion of the second support platform, the second grooves extending laterally across the second support surface from the inner edge portion of the second support platform to the outer edge portion of the second support platform, the third support member being connected to the third support platform between the inner edge portion of the third support platform and the outer edge portion of the third support platform, the third grooves extending laterally across the third support surface from the inner edge portion of the third support platform to the outer edge portion of the third support platform, the fourth support member being connected to the fourth support platform between the inner edge portion of the fourth support platform and the outer edge portion of the fourth support platform, the fourth grooves extending laterally across the fourth support surface from the inner edge portion of the fourth support platform to the outer edge portion of the fourth support platform, the first, second, third, and fourth grooves being configured to allow air to flow therethrough;

an open-ended longitudinally extending first channel defined between the first and second support members, the inner edge portions of the first and second support platforms extending alongside the first channel toward one another;

an open-ended longitudinally extending second channel defined between the second and third support members, the second and third support platforms defining a longitudinally extending second opening into the second channel, a first distance being defined between the second and third support platforms at the second opening, the first distance being greater than a distance defined between the second and third support members within the second channel;

an open-ended longitudinally extending third channel defined between the third and fourth support members, the inner edge portions of the third and fourth support platforms extending alongside the third channel toward one another; and

an open-ended longitudinally extending fourth channel defined between the fourth and first support members, the first and fourth support platforms defining a longitudinally extending fourth opening into the fourth channel, a second distance being defined between the first and fourth support platforms at the fourth opening, the second distance being greater than a distance defined between the first and fourth support members within the fourth channel, the first, second, third, and fourth channels each being configured to allow air to flow therethrough.

15. The sticker of claim 14, wherein the first, second, third, and fourth support surfaces are each planar,

the second support surface is substantially coplanar with the first support surface,

the fourth support surface is substantially coplanar with the third support surface,

the first and second support surfaces face in a first direction, and

the third and fourth support surfaces face in a second direction opposite the first direction.

16. The sticker of claim 15, wherein

the first, second, third, and fourth grooves are configured such that the air flowing therethrough creates vortices or turbulence that helps prevent sticker stain.

17. The sticker of claim 14 constructed entirely of a material that includes aluminum.

18. The sticker of claim 14, wherein the elongated central portion and the first, second, third, and fourth support members have an X-shaped cross-sectional shape in which the first and third support members are substantially collinear, and the second and fourth support members are substantially collinear.

19. The sticker of claim 18, wherein an inside angle defined between the first and second support members is greater than 90° and an inside angle defined between the first and fourth support members is less than 90°.

20. A method comprising:

positioning a first material to define a first row of a stack;

positioning at least two stickers directly on top of the first material, each of the stickers being constructed from aluminum or an aluminum alloy;

positioning a second material directly on top of the stickers to define a second row of the stack; and

allowing the first and second materials to dry or cure within the stack, wherein each of the stickers comprises:

an elongated central portion extending along a longitudinal axis;

a plurality of support members extending radially outwardly from the elongated central portion, the plurality of support members comprising first, second, third, and fourth support members;

a plurality of open-ended channels each defined between a different adjacent pair of the plurality of support members, each of the plurality of open-ended channels extending along the longitudinal axis and being configured to allow air to flow therethrough, the plurality of open-ended channels comprising first, second, third,

and fourth open-ended channels, the first open-ended channel being positioned between the first and second support members, the second open-ended channel being positioned between the third and fourth support members, the third open-ended channel being positioned between the second and third support members, the fourth open-ended channel being positioned between the first and fourth support members; and

a plurality of support platforms comprising first, second, third, and fourth support platforms connected to the first, second, third, and fourth support members, respectively, the first support platform comprising a longitudinally extending first inner edge opposite a longitudinally extending first outer edge, the second support platform comprising a longitudinally extending second inner edge opposite a longitudinally extending second outer edge, the third support platform comprising a longitudinally extending third inner edge opposite a longitudinally extending third outer edge, the fourth support platform comprising a longitudinally extending fourth inner edge opposite a longitudinally extending fourth outer edge,

the first and second support platforms extending toward one another with the first and second inner edges defining a first opening into the first open-ended channel, the third and fourth support platforms extending toward one another with the third and fourth inner edges defining a second opening into the second open-ended channel,

the second and third support platforms defining a longitudinally extending third opening into the third open-ended channel, a first distance being defined between the second and third support platforms at the third opening, the first distance being greater than a distance defined between the second and third support members within the third open-ended channel,

the first and fourth support platforms defining a longitudinally extending fourth opening into the fourth open-ended channel, a second distance being defined between the first and fourth support platforms at the fourth opening, the second distance being greater than a distance defined between the first and fourth support members within the fourth open-ended channel.

21. The method of claim **20**, further comprising:

placing the stack in a kiln comprising one or more fans configured to circulate air within the kiln, at least a portion of the air circulated by the one or more fans flowing through the first, second, third, and fourth open-ended channels of each of the stickers.

22. The method of claim **20**, wherein the first support platform has an outwardly facing first planar support surface that extends from the first inner edge and the first outer edge,

the second support platform has an outwardly facing second planar support surface that extends from the second inner edge and the second outer edge,

the third support platform has an outwardly facing third planar support surface that extends from the third inner edge and the third outer edge,

the fourth support platform has an outwardly facing fourth planar support surface that extends from the fourth inner edge and the fourth outer edge,

the first planar support surface comprises first grooves that extend laterally across the first planar support surface from the first outer edge to the first inner edge,

the second planar support surface comprises second grooves that extend laterally across the second planar support surface from the second outer edge to the second inner edge,

the third planar support surface comprises third grooves that extend laterally across the third planar support surface from the third outer edge to the third inner edge,

the fourth planar support surface comprises fourth grooves that extend laterally across the fourth planar support surface from the fourth outer edge to the fourth inner edge, and

the first, second, third, and fourth grooves are configured to allow air to flow therethrough.

23. The method of claim **20**, wherein the first support platform has an outwardly facing first concave support surface that extends from the first inner edge and the first outer edge,

the second support platform has an outwardly facing second concave support surface that extends from the second inner edge and the second outer edge,

the third support platform has an outwardly facing third concave support surface that extends from the third inner edge and the third outer edge, and

the fourth support platform has an outwardly facing fourth concave support surface that extends from the fourth inner edge and the fourth outer edge.

24. The separator of claim **1**, wherein the first, second, third, and fourth support surfaces are each concave.

25. The sticker of claim **14**, wherein the first, second, third, and fourth support surfaces are each concave.

26. A separator comprising:

an elongated central portion extending along a longitudinal axis;

a plurality of support members extending radially outwardly from the elongated central portion, the plurality of support members comprising first, second, third, and fourth support members;

a plurality of open-ended channels each defined between a different adjacent pair of the plurality of support members, each of the plurality of open-ended channels extending along the longitudinal axis and being configured to allow air to flow therethrough, the plurality of open-ended channels comprising first, second, third, and fourth open-ended channels, the first open-ended channel being positioned between the first and second support members, the second open-ended channel being positioned between the third and fourth support members, the third open-ended channel being positioned between the second and third support members, the fourth open-ended channel being positioned between the first and fourth support members; and

a plurality of support platforms comprising first, second, third, and fourth support platforms, the first support platform comprising a longitudinally extending first inner edge opposite a longitudinally extending first outer edge, the first support member being connected to the first support platform between the first inner edge and the first outer edge, the first support platform having an outwardly facing first concave support surface that extends from the first inner edge to the first outer edge, the second support platform comprising a longitudinally extending second inner edge opposite a longitudinally extending second outer edge, the second support member being connected to the second support platform between the second inner edge and the second outer edge, the second support platform having an outwardly facing second concave support surface that

extends from the second inner edge to the second outer edge, the third support platform comprising a longitudinally extending third inner edge opposite a longitudinally extending third outer edge, the third support member being connected to the third support platform between the third inner edge and the third outer edge, the third support platform having an outwardly facing third concave support surface that extends from the third inner edge to the third outer edge, the fourth support platform comprising a longitudinally extending fourth inner edge opposite a longitudinally extending fourth outer edge, the fourth support member being connected to the fourth support platform between the fourth inner edge and the fourth outer edge, the fourth support platform having an outwardly facing fourth concave support surface that extends from the fourth inner edge to the fourth outer edge,

the first and second support platforms extending toward one another with the first and second inner edges defining a first opening into the first open-ended channel, the third and fourth support platforms extending toward one another with the third and fourth inner edges defining a second opening into the second open-ended channel,

the second and third support platforms defining a longitudinally extending third opening into the third open-ended channel, a first distance being defined between the second and third support platforms at the third opening, the first distance being greater than a distance defined between the second and third support members within the third open-ended channel,

the first and fourth support platforms defining a longitudinally extending fourth opening into the fourth open-ended channel, a second distance being defined between the first and fourth support platforms at the fourth opening, the second distance being greater than a distance defined between the first and fourth support members within the fourth open-ended channel.

27. The separator of claim **26** constructed from a material having a higher thermal conductivity than wood.

28. The separator of claim **26**, wherein together the elongated central portion and at least a portion of the plurality of support members have an X-shaped cross-sectional shape.

29. The separator of claim **26**, wherein the plurality of support members comprises fifth and sixth support members,

the fifth support member is positioned between the first and second support members,

the sixth support member is positioned between the third and fourth support members, and

the fifth and sixth support members are both substantially vertical and substantially collinear.

30. The separator of claim **29**, wherein a fifth support platform is connected to the fifth support member, and

a sixth support platform is connected to the sixth support member such that together the elongated central portion, the fifth and sixth support members, and the fifth and sixth support platforms have an I-beam shaped cross-sectional shape.

31. The separator of claim **30**, wherein together the elongated central portion and the first, second, third, and fourth support members have an X-shaped cross-sectional shape.

32. The separator of claim **26**, wherein the elongated central portion, the plurality of support members, and the plurality of support platforms are each constructed entirely of a material that includes aluminum.

33. The separator of claim **26**, wherein the elongated central portion, the plurality of support members, and the plurality of support platforms are each constructed entirely of aluminum or an aluminum alloy.

34. The separator of claim **26**, wherein the first and second concave support surfaces are configured to rest upon a first item in a stack, and

the third and fourth concave support surfaces are configured to support a different second item in the stack.

35. A sticker comprising:

an elongated central portion that extends along a longitudinal axis;

first, second, third, and fourth support members that extend radially outwardly from the elongated central portion;

first, second, third, and fourth support platforms connected to the first, second, third, and fourth support members, respectively, the first, second, third, and fourth support platforms having outwardly facing first, second, third, and fourth concave support surfaces, respectively, each of the first, second, third, and fourth support platforms having an inner edge portion opposite an outer edge portion, the first support member being connected to the first support platform between the inner edge portion of the first support platform and the outer edge portion of the first support platform, the second support member being connected to the second support platform between the inner edge portion of the second support platform and the outer edge portion of the second support platform, the third support member being connected to the third support platform between the inner edge portion of the third support platform and the outer edge portion of the third support platform, the fourth support member being connected to the fourth support platform between the inner edge portion of the fourth support platform and the outer edge portion of the fourth support platform;

an open-ended longitudinally extending first channel defined between the first and second support members, the inner edge portions of the first and second support platforms extending alongside the first channel toward one another;

an open-ended longitudinally extending second channel defined between the second and third support members, the second and third support platforms defining a longitudinally extending second opening into the second channel, a first distance being defined between the second and third support platforms at the second opening, the first distance being greater than a distance defined between the second and third support members within the second channel;

an open-ended longitudinally extending third channel defined between the third and fourth support members, the inner edge portions of the third and fourth support platforms extending alongside the third channel toward one another; and

an open-ended longitudinally extending fourth channel defined between the fourth and first support members, the first and fourth support platforms defining a longitudinally extending fourth opening into the fourth channel, a second distance being defined between the first and fourth support platforms at the fourth opening, the second distance being greater than a distance defined between the first and fourth support members within

the fourth channel, the first, second, third, and fourth channels each being configured to allow air to flow therethrough.

36. The sticker of claim **35** constructed entirely of a material that includes aluminum.

37. The sticker of claim **35**, wherein the elongated central portion and the first, second, third, and fourth support members have an X-shaped cross-sectional shape in which the first and third support members are substantially collinear, and the second and fourth support members are substantially collinear.

38. The sticker of claim **37**, wherein an inside angle defined between the first and second support members is greater than 90° and an inside angle defined between the first and fourth support members is less than 90°.

* * * * *